<Experimental report>

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<OBJECT>

An object of this experimental report is firstly to evaluate the electrode for electric double layer capacitor and the electric double layer capacitor both manufactured by the method of the present invention, and the electrode for electric double layer capacitor and the electric double layer capacitor both manufactured by the method using a mixture having a concentration of solid contents of below 50wt% (that is the method using the mixture of "Nakao" (US6,246,568) and which is out of the range of the present invention), and secondary to prove that the electric double layer capacitor manufactured by the method of the present invention has high performance.

<EXPERIMENT>

1. Formation of an Electrode Layer

(EXAMPLE 1)

EXAMPLE 1 is corresponding to the Example 1 described in paragraph [0060] of the present application.

While 170 parts of activated carbon (particle diameter: 8 μm, and specific surface area: 2000m^2/g) were stirred with a Henschel mixer, thereto were sprayed and added 20 parts of an aqueous 40% dispersion of carboxyl-modified styrene/butadiene copolymer particles (Tg: -5°C, and particle diameter: 12 μm) having a cross linked structure over 10 minutes. Next, 20 parts of acetylene black were added thereto over 10 minutes, and the components were mixed to obtain a powdery mixture having a particle diameter of 163 μm.

The concentration of solid contents of the powdery mixture was 94.4%, and the powdery mixture was powdered state.

Into a mold, 4 cm×6 cm, was supplied 4.5 g of the resultant powdery mixture, and then the mixture was pressed at a pressing pressure of 10 MPa while heated to 80°C, thereby obtaining an electrode layer sheet of 300 μm thickness.

(ADDITIONAL EXAMPLE 1)

To 285 parts of purity water, 20 parts of an aqueous 40% dispersion of carboxyl-modified styrene/butadiene copolymer particles as described above was added; thereto, 170 parts of active carbon as described above and 20 parts of carbon black were added, and then stirred with a Hobart mixer. The mixture became clayey, lost fluidity and become aggregated.

The concentration of solid contents of the mixture was 40 wt%.

Since the obtained mixture could not be used as it was to form an electrode layer sheet, the aggregated mixture was chipped, dried, and pulverized. The obtained powdery mixture was supplied into a mold, having size of 4 cm×6 cm, 4.5 g of the resultant powdery mixture was supplied, and then the mixture was pressed at a pressure of 10 MPa while heated up to 80°C, thereby obtaining an electrode layer sheet of 300 μm in thickness.

NOTE: We found out that when the Henschel mixer or the like, which could not provide shearing force to the component, was used, it was difficult to mix the clayey component uniformly. So, in ADDITIONAL EXAMPLE 1, Hobart mixer was used, which could provide shearing force to clayey component and could keep mixing the clayey component.

(Production of Electrodes and an Electric Double Layer Capacitor)

In the same method as described in Examples or Comparative Examples in the present application, the electrode and the electric double layer capacitor with the above electrode layer sheet were produced. Then, the produced electrode and electric double layer capacitor were evaluated.

<RESULT>

The result is shown in Table-1 below.

(Table-1)

	Electrode layer strength	Bending strength	Electrostatic capacity (F/g)	Internal resistance (ΩF)
EXAMPLE 1	○	○	53.2	5.6
ADDITIONAL EXAMPLE 1	○	○	38.6	6.4

○: A result better than that of Comparative Example 1 described in the present application was obtained.

<DISCUSSION>

According to the present invention, the electric double layer capacitor having excellent electrode layer strength, high capacity and small internal resistance was obtained. Especially, capacity and internal resistance was improved compared with the case where the mixture like "Nakao" was used to form electrode layer.